

# BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects for discussion invited.

## MENINGITIS

**Frederick Eberson, San Francisco.**—Between 1904 and 1910 a pandemic of epidemic meningitis spread over the world, and since then the disease has appeared in different localities. There has resulted from a series of early outbreaks a number of foci from which the disease takes origin at different times. Epidemic meningitis, cerebral spinal fever, or spotted fever, as it is sometimes called, is an old foe. The disease has prevailed in epidemic form, or sporadically, in this country since 1904 and 1905.

In the *Medical and Agricultural Register*, published in Boston in 1806, is found the account of: "A singular and very mortal disease, which lately made its appearance in Medfield. The symptoms of the disorder, its progress and termination, appearances on dissection and the different methods of treatment are communicated by Doctors L. Danielson and E. Mann, attendant physicians on the sick." Further, we may learn from Elisha North in his classic treatise on a malignant epidemic commonly called "spotted fever" (published in 1811) all that was observed and known about epidemic meningitis at the time. It would appear from these early works that nothing has been added to our clinical knowledge since then, although we must differ with these gentlemen who thought that the disease was not contagious.

We may safely agree with Flexner that the survival of the disease is attributable rather to chronic carriers of the meningococcus than to active carriers of epidemic meningitis. It is these undoubted innocent carriers who become malevolent agents that carry and propagate the infection.

Control of epidemic meningitis posits a study of the mode of infection, detection of carriers and effective serum treatment. There are few diseases so strictly subject to bacteriological control and perhaps none so beautifully responsive to serum therapy. To Flexner in the United States in 1907 and simultaneously in Germany to Kolle and Wassermann and to Jochmann we owe the production of an antiserum. In America Flexner and Jobling during the years 1907-1909, and their coworkers some time later, developed the serum therapy to a high degree and widened its field of application.

Too great stress cannot be laid upon the importance of an early bacteriological diagnosis, the proper serological typing of the organism, and the use of a potent polyvalent serum in which are represented as many different strains of meningococci as it is possible to obtain. Not infrequently serum therapy may fail, owing to the poor

quality of the serum, which may lack potency as measured by agglutination-titer, and also be deficient in the number of representative meningococcal strains. It should be the duty of the physician to check a therapeutic failure of a given serum with the type of organism isolated from the nasopharynx, cerebrospinal fluid, or from the blood stream. Rarely a strain thus isolated has not been incorporated in a commercially prepared therapeutic serum. For the technique of standardization and criteria of a satisfactory serum, one may with benefit refer to the publications of Jobling and of Amoss and coworkers.

Flexner's serum is eloquent testimony of the value of serum therapy in epidemic meningitis. In pre-serum days the mortality from the disease throughout the world ranged between 75 and 80 per cent. Following the use of serum the mortality has averaged 15 to 20 per cent, a distinct therapeutic triumph. Dreaded sequelae and relapses have also been reduced to a minimum. Such results are contingent, however, upon the interval between diagnosis and treatment. Experience has shown that the mortality will increase if serum is administered after the third day of the disease. The number of fatalities may rise to 27 or to 36 per cent, if treatment is delayed till the fourth day, or later. The results of serum treatment in 1300 cases of epidemic meningitis were published by Flexner in 1913, in the *Journal of Experimental Medicine*. Since then experience in the Great War has added more data to show that no disease responds so brilliantly to the administration of serum as does epidemic meningitis.

The serum acts locally upon the microorganism and upon the exudate to arrest the infection and to promote restoration of damaged membranes. The different modes of injection, the advantages of each, and the underlying mechanisms will doubtless be discussed by others. It suffices that the ultimate criterion of the efficacy of a serum is its ability to stop the progress of the disease. The clinical result is the test, but this cannot be made without competent and expert bacteriological study early in the infection.

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**Samuel D. Ingham, Los Angeles.**—The subject of meningitis includes a multitude of conditions, depending upon a variety of etiologic factors and manifesting the widest variations in the clinical picture. Most of the well-known pathologic microorganisms may become localized in meninges and so cause meningitis, predominant among which are the tubercle bacillus, pneumococcus, and different strains of streptococcus and staphylococcus. Invasion of the meninges by the *Treponema pallidum* is probably among the most

frequent, but it is comparatively seldom that it manifests itself in frank symptoms of meningitis. Intracellular coccus of epidemic meningitis is relatively rare, except in epidemics. The diplococcus of Neisser is an occasional visitor, and even some of the fungi are occasionally found.

The certain diagnosis in each case is dependent upon the bacteriological study of the cerebral spinal fluid removed by lumbar puncture, which fact in itself establishes the value of this important procedure. In addition to the type of meningitis caused by a definite bacteriologic invasion, the clinical picture of meningitis frequently manifests itself when the most careful examination of the cerebral spinal fluid fails to reveal the presence of any bacteria. This is true in regard to the clinical signs of meningitis which are frequently a part of the clinical picture of acute anterior poliomyelitis. This is particularly true in those forms of so-called serous meningitis, or menin-gismus, which manifest acute symptoms for a time, and follow a benign course. The symptoms of this group of cases are dependent upon irritative processes in the meningeal system, and are evidently caused by toxins, by meningeal invasion of germs which do not get into the spinal fluid, or by ultramicroscopic organisms.

That symptoms of meningitis may result from nonbacterial agents has been repeatedly demonstrated by attempts at intraspinal medication. Even the intraspinal injection of serum, as in the treatment of tetanus, results in not only symptoms of meningeal irritation, but also a definite pleocytosis.

Symptoms of meningitis also occur in connection with typhoid fever, influenza, pneumonia, etc., as a symptom of meningeal congestion and irritation as part of a general process, rather than a localized pathologic condition.

The clinical diagnosis is usually easy on the basis of a few classic signs and symptoms; nuchal rigidity, opisthotonos, Kernig's sign, Brudzinski's sign, photophobia, general irritability. While these symptoms are referred to as due to meningeal irritation, they are, without exception, due to irritation of the nerve tissues in proximity to the meninges, resulting in muscular contractions, heightened reflexes, and generally increased nervous irritability.

With the exception of immunized serum for epidemic meningitis, there is no specific treatment available. Frequent lumbar puncture for the removal of the excess of spinal fluid usually present is widely favored, and is particularly beneficial in so-called meningismus. In purulent meningitis resulting from the staphylococcus it is sometimes necessary to use a large spinal needle and to employ aspiration in order to remove the thick, creamy pus from the spinal canal. Irrigation of the meningeal sac by combined cisterna and lumbar puncture, facilitating through-and-through drainage, has been successfully used in some cases. The general management, nursing, and

feeding of the patient is, as in other diseases, often the most important part of the treatment.

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**William W. Belford, San Diego.**—Meningococcus meningitis is most common in childhood; about 80 per cent of all cases occur within the first ten years. It is not a rare finding in the first three months of life. The diagnosis is not always simple in children; in fact, the lumbar puncture findings alone may furnish the only evidence of meningeal involvement. The disease has been notorious through the years for its varying clinical pictures. A terrible fulminating form occurs in about 5 per cent of all cases of this type of meningitis, and it is so often not recognized until a postmortem is done. The most dependable sign is muscular rigidity, but only some 75 per cent show this. If one just remembers the possibility of meningococcic meningitis and does a lumbar puncture early, many more obscure cases will come to diagnosis and helpful treatment.

Treatment in this form of the meningitis must be vigorous and continued until the organisms are killed off. Serum is given by all avenues—intravenous, intraspinal, by cistern puncture, and through fontanelle into ventricles if needed. In some cases treatment is easy and in others difficult, depending on severity of disease, duration when treatment was begun, potency of serum, reaction of patient, etc.

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**W. H. Eustis.**—The life of W. H. Eustis demands the attention of the medical profession. The generosity of the former mayor of Minneapolis laid the foundation for medical activities which in the years to come will do an immeasurable amount of good to a multitude of crippled children throughout the state. A cripple himself, he realized better than anyone not so afflicted the handicap a crippled child has in the struggle of modern-day life. The wealth that he accumulated as a result of keen business judgment has been given in toto to furnish medical and surgical aid to crippled children. The term "cripple" is used in a broad sense to cover not only those children crippled through bone and joint disease, but those handicapped in any way through accident or disease.

More than five years ago a tract of land on the bank of the Mississippi River was given to the state as a site for a convalescent home for needy crippled children, and the adjoining property where the Michael Dowling school now stands was also donated. Mr. Eustis' entire fortune of a million and a half has been bequeathed to build and endow the hospital, which will be known as the Minnesota Hospital and Home for Crippled Children. Mr. Eustis was born in the village of Oxboro, New York, July 17, 1845, of English parentage. He died in Minneapolis, November 29, 1928, at the age of eighty-three. Robust as a child, a crippling accident at the age of fifteen forced a complete change in his life. The difficulty he encountered in obtaining proper medical advice and the obstacles met in obtaining an education resulted in his decision to devote his wealth to assist others similarly handicapped.

His generosity is an inspiration in an age when wealth is so commonly thought to be an end in itself. How much better to be remembered by posterity in this manner than, for instance, by a building towering above all others, desirable as a skyscraper may be.—*Minnesota Medicine.*